BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

R2

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 June 2001 (07.06.2001)

PCT

(10) International Publication Number
WO 01/40921 A1

(51) International Patent Classification[7]: G06F 3/03, 17/30 // 161:00

(21) International Application Number: PCT/DK00/00662

(22) International Filing Date: 1 December 2000 (01.12.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/168,474 1 December 1999 (01.12.1999) US
09/724,946 28 November 2000 (28.11.2000) US

(71) Applicant *(for all designated States except AU, BR, CA, CN, GB, IE, IN, MX, NZ, SG)*: **LEGO A/S** [DK/DK]; Aastvej 1, DK-7190 Billund (DK).

(71) Applicant *(for AU, BR, CA, CN, GB, IE, IN, MX, NZ, SG only)*: **INTERLEGO AG** [CH/CH]; Neuhofstrasse 21, CH-6340 Baar (CH).

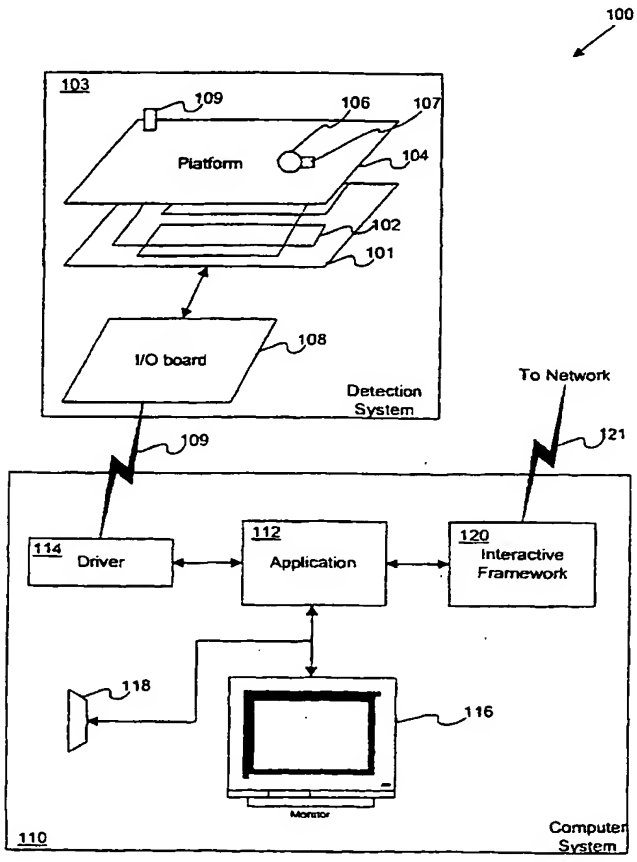
(72) Inventors: **VESCOVI, Marcos, R.**; 119 Quillen Court, Apt. 6H, Stanford, CA 94305 (US). **SAKALOWSKY, John**; 124 Vicksberg Street, San Francisco, CA 94114 (US). **KUMAR, David, N.**; 810 Ladis Court, Sunnyvale, CA 94086 (US). **JORDAN, Adam, C.**; 1133 Cole Street, San Francisco, CA 94112 (US).

(74) Agent: **HOFMAN-BANG A/S**; Hans Bekkevolds Allé 7, DK-2900 Hellerup (DK).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM,

[Continued on next page]

(54) Title: REMOTE DATA ACCESS THROUGH MANIPULATION OF PHYSICAL OBJECTS



(57) Abstract: Disclosed are methods and apparatus for communicating over a computer network through the intuitive placement and movement of one or more physical objects. In general terms, a sensor and one or more physical objects are provided. The sensor may form part of a platform upon which objects are placed or the sensor may be located proximate to such a platform. When one or more of the physical objects are moved over particular portions of the platform, data content may be accessed from a remote site depending on the placement or movement of such objects. The data content may be displayed as part of a particular application associated with the platform and/or physical objects. In a specific implementation, the platform represents a game board and the physical objects are game pieces for moving over the game board. When the game pieces are moved to particular board locations, game modules are downloaded to and executed on the user's local computer game system (e.g., on a computer display or television screen). In another implementation, particular web pages that enhance the game experience are accessed and displayed for the user when the user moves one or more game pieces over a particular board location.

WO 01/40921 A1

HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) **Designated States** *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— *With international search report.*

— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

REMOTE DATA ACCESS THROUGH MANIPULATION OF PHYSICAL OBJECTS

By Inventors:

Marcos R. Vescovi, David Kumar, John Sakalowsky, and Adam C. Jordan

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application No. 60168,474 by Vescovi et al., filed 1 December 1999, entitled INTERNET ACCESS THROUGH MANIPULATION OF ONE OR MORE PHYSICAL OBJECTS. This application is also related to (1) U.S. Patent No. 5,953,686 by Piernot et al., issued 14 September 1999, entitled VIDEO CAMERA BASED COMPUTER INPUT SYSTEM WITH INTERCHANGEABLE PHYSICAL INTERFACE, (2) U.S. Patent Application No. 09/018,023 by Piernot et al., filed 2 February 1998, entitled COMPUTER METHOD AND APPARATUS FOR INTERACTING WITH A PHYSICAL SYSTEM, (3) U.S. Patent Application No. 09/144,951 by Vescovi et al., filed 1 September 1998, entitled DETECTING PHYSICAL OBJECTS STATES USING ELECTROMAGNETIC SENSORS, (4) US. Patent Application No. 08/017,450 by Vescovi et al., filed 2 February 1998, entitled CODED OBJECT SYSTEM AND CODE RECOGNITION METHODS, (5) U.S. Patent 6,108,612 by Vescovi et al., issued 22 August 2000, entitled CODED OBJECTS AND METHODS FOR DETECTING SUCH CODED OBJECTS. These patent applications are herein incorporated by reference in their entirety.

BACKGROUND OF THE INVENTION

The present invention pertains to apparatus and methods for remotely accessing data through a network.

The digital living room with the central television set has been the target of many content delivery vehicles and content providers. Currently, there are over four hundred cable channels. Even more content is being offered by satellite channels. Most recently, web access has been added to television content delivery systems. With the addition of the web, potentially millions of web pages are accessible to the user through his/her television. Set top box equipment scheduled to be introduced soon, along with the new generation of game consoles, are also equipped to provide access to significantly more content.

As the WEB and cable television begin to contain a large number of content varieties and subjects, increasingly, the user finds locating a particular content segment (*e.g.*, channel or web page) difficult. In other words, the user typically finds it difficult to sift through such a vast array of choices. Traditional remote controls provided with cable boxes and television sets are cumbersome tools for searching through content. On screen menu system are increasingly becoming too crowded and unuseable as the number of content choices rapidly increases.

Though the variety and size of content has grown, the user has been unable to access such content with the ease of the traditional remote control unit and television network system. Several remote controls boast increasing numbers of option selection features and numerous buttons. However these additions have not made the interaction easier in any way. Navigating through the myriad of channels and time slots using buttons and second-function buttons has become a complex exercise. The introduction of WEB content through equipment such as the WEBTV has made it even more difficult to use a remote control to access content.

Additionally, recording future programs has become increasingly difficult in the typical household with several remote control units and the high number of available channels. Even the universal remote controls cannot seem to tackle the task any better. The users have largely ignored the introduction of VCR+ features with its need for complicated initial connections necessary to interconnect cable, TV and VCR equipment.

There are, of course, a number of human/computer interfaces which allow users, with varying degrees of comfort and ease, to interact with computers. For example, keyboards, computer mice, joysticks, etc. allow users to physically manipulate a single three-dimensional object (*e.g.*, by typing or pointing and clicking) to search through remote content. However, these human/computer interfaces are quite artificial in nature, and tend to require a substantial investment in training to be used efficiently. The artificial metaphors tend to break down and systems such as keyboards and mice tend to have inherently low rates of data input.

Accordingly, a simpler mechanism for accessing remote content is desired. Such mechanisms would also preferably provide ready access to content using natural intuitive motions.

Summary of the Invention

Accordingly, the present invention provides methods and apparatus for communicating over a computer network through the intuitive placement and movement of one or more physical objects. In general terms, a sensor and one or more physical objects are provided. The sensor may form part of a platform upon which objects are placed or the sensor may be located proximate to such a platform. When one or more of the physical objects are moved over particular portions of the platform, data content may be accessed from a remote site depending on the placement or movement of such objects. The data content may be displayed as part of a particular application associated with the platform and/or physical objects. In a specific implementation, the platform represents a game board and the physical objects are game pieces for moving over the game board. When the game pieces are moved to particular board locations, game modules are downloaded to and executed on the user's local computer game system (*e.g.*, on a computer display or television screen). In another implementation, particular web pages that enhance the game experience are accessed and displayed for the user when the user moves one or more game pieces over a particular board location.

In one embodiment, an interactive system associated with a first computer for

communicating with a second computer over a wide area network is disclosed. The interactive system includes a detection system having a plurality of physical objects and a sensor. The physical objects have a plurality of states that are each detectable by the sensor. The interactive system further includes a computer readable medium having programming instructions for communicating with the detection system and the second computer. Communication with the second computer is based on a combination of two or more states of the physical objects detected.

In another embodiment, the interactive system has a detection system having a physical object and a sensor. The physical object has a plurality of states that are each detectable by the sensor and that are states other than position states of the physical object relative to the sensor. The interactive system also includes a computer readable medium having programming instructions for communicating with the detection system via the first computer and for communicating with the second computer via a wide area network. Communication with the second computer network is based on a current state of the physical object.

In an alternative embodiment, the interactive system includes a detection system having a physical object and a sensor, and the physical object has a plurality of orientation positions that are each detectable by the sensor. The interactive system also has a computer readable medium having programming instructions for communicating with the detection system via the first computer and the second computer via a wide area network (*e.g.*, the Internet). Communication with the second computer is based on a current orientation of the physical object.

In yet another alternative embodiment, the interactive system includes a detection system having a plurality of physical objects and a sensor. The physical objects have a plurality of positions that are each detectable by the sensor. The interactive system also includes a computer readable medium having programming instructions for communicating with the detection system and the second computer. Communication with the second computer is based on one or more positions of the physical objects, wherein the positions are detected by the sensor and are non-discrete. A method for using such a system is also disclosed.

In yet another embodiment, the interactive system has a detection system having a plurality of physical objects and a sensor. Interaction data associated with the physical objects is detectable by the sensor. The interactive system further includes a computer readable medium having programming instructions for communicating with the detection system and the second computer. Communication with the second computer is based on detected interaction data associated with one or more of the physical objects. The communication is in the form of either downloading game content from the second computer to the first computer, posting game content from the first computer to the second computer, displaying a web page at the first computer, initiating a chat session between the first and second computers, sending or receiving an email message to or from the second computer, setting up a video conference, or streaming video or audio to the first computer from the second computer or to the second computer from the first computer. A method for using such a system is also disclosed.

These and other features and advantages of the present invention will be presented in more detail in the following specification of the invention and the accompanying figures which illustrate by way of example the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic representation of an interactive content access system in accordance with one embodiment of the present invention.

FIG. 2 is a flowchart illustrating a process of utilizing an interactive content access system, such as the system in FIG. 1, in accordance with one embodiment of the present invention.

FIG. 3 is a flow chart illustrating the operation of FIG. 2 of interrupting the extracted data in accordance with one embodiment of the present invention.

FIG. 4 is a flow chart illustrating the operation of FIG. 2 of executing an

application program based on data associated with one or more physical objects in accordance with one embodiment of the present invention.

FIG. 5 is a diagrammatic representation of an interactive television system in accordance with an alternative embodiment of the present invention.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

Reference will now be made in detail to the specific embodiments of the invention. Examples of the these specific embodiments are illustrated in the accompanying drawings. While the invention will be described in conjunction with these specific embodiments, it will be understood that it is not intended to limit the invention to the described embodiments. On the contrary, it is intended to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. The present invention may be practiced without some or all of these specific details. In other instances, well known process operations have not been described in detail in order not to unnecessarily obscure the present invention.

In general terms, the present invention provides mechanisms for a local computer system to access data content from a remote site or send data content to a remote site by manipulating one or more physical objects within a physical system or landscape in communication with the local computer system. The physical objects and/or landscape may take any suitable form. Preferably, the physical objects and landscape symbolically represent the type of data content being accessed or sent. For example, the objects may represent characters that are moved over a game board coupled to a computer or television upon which a computer adventure game is presented. In a specific example, new content is retrieved and displayed when a character object is moved to a symbol on the board that represents or depicts some form of transportation device, such as a teleport pad. In this example, the user's

game character is then transported to a new landscape or world (*e.g.*, new game content is downloaded), which new world is displayed on the user's computer screen. In this embodiment an intuitive physical system is provided to allow easy access to on-line activities.

Any suitable data content may be accessed from a remote site based on positional and/or identity data of one or more physical objects. By way of general examples, data content accesses may include hypertext transfers, text or graphical file transfers (*e.g.*, via ftp), and email transfers from a remote site to the local user site. In the above game application, as game pieces are moved over a game board, new game modules or content may be automatically downloaded into the computer game system to provide additional game features (*e.g.*, additional character abilities, additional game interactions, and additional game characters). For example, additional game scenarios may be downloaded from a remote site into the local game system for an adventure type game. In another example, the objects may represent "brick and mortar" buildings that activate corresponding business web sites when placed on a sensing platform coupled to a computer system. For instance, when a building piece that resembles a pet shop is placed within a particular spot on the platform, a corresponding on-line pet shop's web page is displayed on the user's computer system display. Alternatively, when a character piece moves next to a building piece or onto a building symbol on the platform, a web page that corresponds to the building is displayed.

Data content may also be posted or transmitted from the local system to another remote site through the manipulation of physical objects. In the game example, the user may post game content through the placement or movement of game pieces or physical objects. In another example, an email is sent from the user site to a remote site when one or more physical objects are arranged or moved in particular configurations.

Communication between the local computer system and one or more remote computer systems may also be initiated through the physical objects. For example, multiple user play may be initiated through the orientation of physical objects

relative to one another or the location of one or more physical objects relative to a game platform. For instance, game characters corresponding to remote players may be added to the local user's game display. Other communication types include email exchanges, chat sessions, video and/or audio streaming, and video conferencing. For example, game players may exchange statistic cards for their game characters in an adventure type game or dollhouse wallpaper for their dollhouse design game.

FIG. 1 shows an interactive system 100 in accordance with one embodiment of the present invention. The interactive system 100 is configured to provide remote access to data content (as well as local content) based on detected positions and/or identities of one or more physical objects. The interactive system 100 includes a detection system 103 and a computer system 110. The detection system generally detects positional and/or identity data from one or more physical objects and communicates the detected data to the computer system. The computer system 110 generally analyzes the detected data and selects which data content (if any) to access based on the detected data. The data content may reside locally on computer system 110 (*e.g.*, in application software 112) or reside on a remote computer system (not shown) accessible through a network interface 121. The data content form depends on the particular application (*e.g.*, game content for a game application).

The detection system 103 may include any suitable mechanisms for detecting the presence, positions, and identities of the various objects (e.g., 106). In the illustrated embodiment of FIG. 1, the detection system 103 is in the form of an electromagnetic detection system for detecting the objects and inputting the detected data to the computer system 110. Any suitable electromagnetic detection system may be implemented. Several examples of electromagnetic detection systems that work well with the present invention are described in PCT Application No. PCT/GB98/01759 (WO98/58237(A1)) and US Patent 5,815,091, which are herein incorporated by reference in their entirety.

As shown, the detection system 103 includes an I/O board 108, a printed circuit (PC) board 101 having an antenna 102, a platform 104, and one or more objects (*e.g.*, 106 and 109). FIG. 1 includes an exploded perspective of the printed

board and platform so as to more clearing illustrate these parts. One or more of the objects each include a resonator. In one implementation, each resonator is in the form of a coil in series with a capacitor, which resonates at a particular resonating frequency. An excitation signals may be applied to antenna 102 to excite a particularly configured resonator of a particular object. In response to the excitation signal, a resonating signal from the object that has the same frequency as the excitation signal and that is located proximate to the antenna 102 is sensed by the antenna 102. The platform 104 is placed relative to the antenna 102 so that objects placed near the platform are detectable by the antenna 102.

The platform 104 may be a visual representation of the particular application software 112. For example, the platform 104 may be in the form of a game board for a particular game application software. Of course, the detection system does not require a platform. That is, the objects may simply be placed proximate to the printed board 101 and antenna 102 embedded therein.

The antenna 102 may be any suitable form for sensing positions of the objects. In a specific implementation, the antenna 102 is in the form of four transmission coils and four reception coils. The transmission coils are configured to approximate multiple period sin and cos fields in the x direction, as well as multiple period sin and cos fields in the y direction. Likewise, the reception coils approximate multiple period sin and cos fields in both the x and y directions. Preferably, the sin and cos reception coils each have a different number of periods to facilitate determination of a position of a resonator along such coils.

The computer system 110 may include, among other things, a driver 114, application software 112, interactive framework software 120, display 116, and speakers 118. Several well known components of a computer system, such as a processor and memory unit, are not described or included within FIG. 1 so as to not obscure the invention.

The I/O board 108 provides an interface between the detection system 103 and computer system 110. In one embodiment, the I/O board passes signals for

controlling the other components of the detection system (*e.g.*, the antenna 102 and PC board 101) from the computer system 110 to the detection system components and passes detected data signals from the one or more physical objects to the computer system 110.

Application software 112 generally controls the detection system 103 via I/O board 108. The application software controls what signals are transmitted over the transmission coils and analyzes signals received on the reception coils in response to the transmitted signals. Although the application software 112 is shown as residing only on the computer system 110, of course, it may also reside elsewhere (*e.g.*, within memory of the I/O Board or the PC Board). Alternatively, a portion of the application may also be downloaded to a microprocessor within the PC board 101 (not shown).

The application software may be configured to select specific objects to be detected by the detection mechanism. In other words, the software selects which object is to be polled. The software also selects a frequency that corresponds to the resonating frequency of the selected object. Alternatively, the specific objects may output coded signals that identify the corresponding objects. The application software then analyzes the coded signals to determine an identity and position of each of the corresponding objects.

In the later example, after a particular object and its corresponding frequency are selected, the software then causes an excitation signal having the selected frequency to be sequentially generated on each of the transmission coils (sinx, cosx, siny, cosy). Each of the transmitted excitation signals is in the form of an AC current having the selected frequency that causes an AC field over each of the transmission coils.

If present, the resonator of the corresponding object resonates in response to the AC field of each excitation signal, thereby inducing an AC field in the resonator. The AC field of the resonator couples with corresponding reception coils to induce a resonator signal on the reception coils. In effect, the resonator of the object reflects

the excitation signals onto the corresponding reception coils in the form of a resonator signal.

Any suitable mechanisms may be implemented to convert the resonator or detected signals into signals that are appropriate for input into a computer system. As shown, the detected signal is sent through the I/O board 108 through driver 114 to application program 112. The I/O board 108 may be arranged to convert a detected signal to a digital signal (e.g., a binary pulse wave) that corresponds to an average voltage value.

In a specific implementation, the average voltage of each resonator signal from each reception coil may be obtained by amplifying, mixing, and filtering each resonator signal. This signal processing may be performed by any suitable hardware and/or software components (*e.g.*, located within the PC board 101). In a specific implementation, each resonator signal is amplified and mixed with a square wave having the same frequency as the excitation signal, but is 180 degrees out of phase, to obtain a rectified version of each resonator signal. The rectified signal is then sent through a low pass filter to obtain the average voltage. The resulting average voltages are then sent through an analog-to-digital converter to the application software. The application software determines the x and y position of the object based on the relative average voltages of the resonator signals on the reception coils. The object's position along each reception coil affects the relative values of the average voltages. For example, if a phasor vector is formed from the sin average voltage and the cos average voltage of the x direction reception coils, the phasor's angle correlates with the object's x position relative to the x direction reception coils. In other words the angle of the phasor vector is directly related to the x position of the object. Likewise, the y position can be determined from the sin and cos average voltages of the y direction reception coils. The phasors' amplitude corresponds to the object's z position.

The application software 112 analyzes the detected signals to determine positions and identifications of the various objects of the detection system 103, as well as to provide data content. The driver 114 is arranged to facilitate

communication between the application software 112 and the I/O board 108. The positional and/or identity data may be used by the application program to generate an audiovisual program (*e.g.*, a computer game) based on the detected position signals and corresponding object identities. This data may also be used to access remote data to enhance the audiovisual program. For example, the positional and/or identity data is passed to the framework software 120, which then accesses remote data content, sends data to a remote site, or initiates a communication session between the local site and a remote site. In one embodiment, the framework software 120 includes web browsing capabilities, email functions, and file transfer mechanisms. Preferably, the framework software 120 is separate from the application software 112 to allow easy expansion of on-line capabilities and compatibility maintenance. Of course, the features of the application and framework software may be integrated into a single software module. Alternatively, the application and/or framework may be implemented with hardware and/or software.

The above detection process is repeated for each frequency value. That is, the application software initiates an excitation signal at a second frequency value that corresponds to a next object; initiates an excitation signal at a third frequency value that corresponds to a next object; etc. The frequency values are sequentially used to detect the positions of each object.

The detected signal may include positional data regarding the resonator circuits of one or more physical object(s) of the detection system 103, such as the objects, interactive devices, etc. That is, positions of one or more physical object(s) may be ascertained by analyzing the detected signal. In one embodiment, the positional data includes six degrees of position states: x, y, and z position, rotational angle, tilt, and yaw. One example of an electromagnetic sensing system that senses six degrees of positional data is described in the above referenced PCT patent application. Of course, the positional data may include any subset of these six degrees of position states.

Of course, it should be recognized that other detection systems may be used, such as optical sensors or electronic sensors. For example, a camera based detection

system may be implemented. In this implementation, the tools and objects include visually detectable markers, such as barcodes, and a camera is mounted for detecting such makers. In one specific implementation, each tool or object has a unique barcode. The camera sends its detected images to an image processor which then analyzes the image to determine positions and/or identities of the object or tool markers. Several embodiments of camera based systems and detection techniques are further described in the above referenced U.S. Patent Numbers 5,953,686 and 6,047,249 and U.S. Application Numbers 09/017,450 and 09/103,265.

To detect and identify the objects of the detection system 103, at least some of the objects will include at least one detectable marker. When the markers are placed or moved within the platform 104 (e.g., by placing an object on the platform and moving the object over different portion of the platform), the positions of the markers may be sensed by the detection mechanism. Preferably, the markers also identify the object. That is, the detection mechanism is able to distinguish between the different markers of the different tools and objects. In the above described electromagnetic detection system, each object includes a unique resonator circuit that resonates at a unique frequency. Alternatively, some or all of the objects may include the same resonator circuit, but the resonator circuit is placed at a different z position of the object. In this embodiment, each object is identified when it is placed one at a time onto the platform. Thus, each object will have a different detectable z position when it is placed on the platform. The z position can then be used to distinguish between the objects. Several mechanisms for identifying resonator type objects are also described in above referenced U.S. Patent Application Number 09/144,951. In an optical camera based detection system, each object may include a unique detectable visual marker, such as a barcode. Several mechanisms for identifying visually marked objects are described further in above referenced U.S. Patent Numbers 5,953,686 and 6,047,249 and U.S. Application Numbers 09/017,450 and 09/103,265.

Although the computer system 110 is shown as being a separate component from the detection system 103, of course, the computer system 110 may be integrated

with the detection system 103. Additionally, it should be understood that other type of interfaces or computer systems may be used, such as a television system or set top box (See Fig. 4 and associated description below). Also, the I/O board 108 may be a separate device from the detection system 103 and computer system 110.

The interactive system 100 may include any number and kind of objects. The objects are used to interact with portions of the detection system 103 (*e.g.*, platform 104) so as to initiate content delivery, *e.g.*, Internet usage. The interactive system may also include interactive devices, which are defined as objects that have more than one state. For example, an interactive device may be in the form of a button, switch, or knob.

Some of the objects may also include an interactive device 107, such as a button. The detection system 103 may also include one or more fixed interactive devices (*e.g.*, 109), such as a switch or button, (i.e., the device has a fixed resting position). In short, the objects and interactive devices may be fixed or movable within the detection system 103. An interactive device may be associated with a particular object or may be an independent object within the detection system 103. As described above, each object and interactive device may be configured with a resonator that resonates at a distinct frequency. Of course, if an interactive device is associated with an object, the pair may have a single resonator.

Any suitable technique may be implemented for obtaining positional and/or identity data from the detection system and using such data to access content (remotely or locally). FIG. 2 is a flowchart illustrating a process 200 of interfacing with a detection system, such as the system in FIG. 1, in accordance with one embodiment of the present invention. Initially, a detection system is provided in operation 202. In operation 204 portions of the detection system (*e.g.*, the platform 104) are scanned to extract data. The extracted data includes information regarding the physical objects (*e.g.*, objects and interactive devices) of the detection system. For example, the extracted data includes positions and orientation for each physical object relative to each other and/or relative to the platform. Also, the extracted data may include identifiers associated with each physical object. Alternatively, the

identity of an object is already known and used to detect positional data from the identified object.

In a detection system that includes electromagnetic sensing technology, the data is extracted by initiating an excitation signal at a predetermined frequency on an antenna. The excitation signal is then stopped, and it is determined whether a detected signal is *present* on the antenna from one or more resonators within the detection system. The detected signal may include positional information related to the responding resonators of the detection system. The predetermined frequency may correspond to an identity of a responding resonator. A succession of excitation signals having different predetermined frequencies may be initiated on the antenna to detect the presence and position of multiple physical objects having different resonating frequencies. The identity of each object may correspond to the object's resonance frequency or the position (*e.g.*, z position) of the resonator of the object.

After the data is extracted from portions of the platform, the extracted data is interpreted in operation 206. For example, the extracted data may be analyzed to determine the relative positions and identities of various physical objects within the detection system. The extracted data may also be analyzed to determined the relative positions and identities of the detected physical objects and various regions of the platform. Operation 206 is described in further below in reference to FIG. 3.

After the data is interpreted, it is then determined whether remote data content is to be accessed in operation 208. This determination is based on the results from the interpretation operation 206 and also depends on the particular requirements of the application. For example, particular remote content may be accessed when a particular object is positioned within a particular area of the platform. In another example, particular remote content may be accessed when any object is positioned within such area. Particular remote data may be accessed when two or more objects have a particular orientation relative to each other and/or a particular area of the platform.

If it is determined that remote content is required, the remote data is then

accessed in operation 210. For example, a background file transfer may be performed, where data content is downloaded (*e.g.*, through a script file) so that the application may later use by the application. In another implementation, additional game character costumes or adventure worlds may be downloaded to specific game directories within the game structure. Such game directories are accessible by the game application. Content may also be posted (instead of access remote data content) to a remote site. In specific examples, user-created content such as movies, team logos, treasures, or game content can be posted to a remote server, where it is screened and then made accessible to other users.

If remote data is not to accessed, operation 210 is skipped. The application is then executed based on the accessed data (if any) in operation 212. For example, an audiovisual program is run that is based on the extracted data and any previously extracted and recorded data. For example, the relative position of regions of the platform and the previous physical object positions may have been previously recorded and thereby accessed to generate a new audiovisual program.

The execution of the application may include merely one visual frame or may include one frame of a sequence of frames from a video. For example, the operation of executing the application may initiate a continuous audiovisual sequence (e.g., a Quicktime movie) or merely continue at a particular point within the movie. By way of another example, an audiovisual program may be executed that only has one frame. By way of another example, the audiovisual program may include an interactive game, wherein the player is directed to perform certain tasks with the physical objects.

After the application is initiated or continued, the extracted data information is recorded in operation 214. After the extracted data is recorded, it is determined whether a shutdown of the interactive system has been initiated in operation 216. This may be accomplished in any suitable manner. For example, when the all of the physical objects are removed from the platform, this may be detected and interpreted as a shutdown. Alternatively, the detection system may include an on/off switch. Otherwise, the application may simply be ended (*e.g.*, with an exit command). If a

shutdown has not been initiated, the process returns to operation 204, where portions of the platform are scanned once again to extract data. After portions of the platform are scanned once again, operations 204 through 214 are repeated and may use the previously recorded data. When shutdown is initiated, the process 200 ends until it is initiated again (*e.g.*, when physical objects are placed on the platform or the detection system is switched on).

FIG. 3 is a flow chart illustrating the operation 206 of FIG. 2 of interpreting the extracted data in accordance with one embodiment of the present invention. Initially, the positions of selected physical objects that are present are determined in operation 302. The detection system may be designed such that physical objects may be placed on the platform one at a time, or so that two or more physical objects may be placed simultaneously on the platform. The identifiers of the selected physical objects are determined in operation 304 (*e.g.*, by correlating the selected object's resonator frequency with an identity).

It is then determined whether the selected physical objects are associated with a region or "hot zone" on the platform in operation 306. That is, when a physical object is placed within a hot zone, a corresponding audiovisual application is generated. A hot zone is defined as a particular portion on the platform that is relevant to determining which content to select. In other words, the hot zones may be defined as regions where moveable objects may be placed or where fixed interactive devices, such as a fixed push button, are located. Alternatively, a hot zone may be defined relative to the sensor or antenna. The hot zones that are associated with a physical object are then identified in operation 308. For example, the hot zone associated with the physical object may be identified to determine what type of interaction will take place with the particular physical object. By way of specific example, a portion of the platform may be identified as being magnified (*i.e.*, by the audiovisual program) when a magnifying type object is placed on it. In this case, a web page representative of such magnification may be presented to the user (*e.g.*, in operation 212 of FIG. 2).

The states of any interactive devices are then determined in operation 310.

The interactive devices may be in any suitable form for indicating a different state of a physical object. For example, a physical object may include a button which may be pushed in or let out. It is then determined whether the button is pushed in operation 310. The process then returns to operation 212 of FIG. 2 where an application is executed that is based on the interpretation of the extracted data.

It should be well understood to those skilled in the art that operations 302 through operation 310 may be executed in any order that is appropriate for the particular application. For example, operation 302 may be executed subsequent to operation 304. Additionally, other information from the extracted data may be interpreted or not interpreted depending on the particular requirements of the particular application. For example, if the detection system does not include any interactive devices, operation 310 is not required. By way of another example, an operation to determine the identification of the platform itself may be included in order to aid in choosing which application will be run in operation 212 of FIG. 2. For example, various platforms may be utilized with the detection system 103. The platforms may themselves include resonators with different resonating frequencies, differently positioned resonators having the same frequency, or different barcodes,

FIG. 4 is a flow chart illustrating the operation 212 of FIG. 2 for executing an application program based on data regarding one or more physical objects in accordance with one embodiment of the present invention. Initially, it is determined whether there are any physical objects associated with any hot zones in operation 402. If there are no physical objects associated with a hot zone, the process returns to operation 214 of FIG. 2, and the extracted data is recorded.

If there are physical objects associated with a hot zone, a physical object is selected in operation 404. A physical object may be selected in any suitable manner. For example, a physical object which was placed upon the platform first may be selected first. A corresponding application program, such as a game, is then executed or continued in operation 406. The application program is based on the selected physical object, the physical object identifier, a state of any associated interactive device, and/or the associated hot zone identifier. In other words, the

application program may depend on which physical object is selected and where such physical object is positioned in relation to hot zone regions. For example, a second on-line player, in addition to the local user, is added to the game currently being executed for the user. In one embodiment, a second character, in addition to the user's first character, is displayed within the game displayed at the user's site. This second character is controlled by the off-line second player, while the user controls his own first character.

After the application program segment runs its course, it is then determined whether there are more physical objects to select in operation 408. If there are more physical objects to select, it is selected in operation 404. Another application segment is executed continues in operation 406. That is, the application that is currently running is updated based on the positions of the selected physical object. For example, a third on-line player or a third web page relevant to the game story line is added to the game. However, if there are no more physical objects to select, the process returns to operation 214 of FIG. 2 and the extracted data is recorded for a next scan of the platform (*e.g.*, operation 204). Of course, each physical object does not have to be separately selected prior to each application update. Alternatively, the application program may simply be executed or updated based on selection of *all* physical objects or a subset of the same within the detection system.

FIG. 5 is a diagrammatic representation of a remote control system 500 for accessing content through a television 510 in accordance with an alternative embodiment of the present invention. As shown, the remote control system includes a detection system 103' in the form of a tablet-like controller and a computer system 110' in the form of a set top box (or satellite receiver) 110. The tablet-like controller 103' includes one or more physical objects 502 and may also include a pen device 504. Content may be selected by moving one or more physical objects 502 to particular positions on the tablet 103' or by arranging two or more physical objects 502 into a particular orientation relative to each other. Additionally, content may be selected via handwriting motions of the pen device 504.

Positional and/or identity data is scanned from the detection system 103' and

transmitted to the set top box 508 by any suitable mechanisms, such as an IR (infrared radiation) link circuit or other wireless link within the detection system. This data is then analyzed by the set top box 508 to determine which content to access, for example, through a cable network interface 512. In the illustrated embodiment, the tablet 103' includes a sensing area 508 upon which physical objects are detectable and a inactive area 506 upon objects may be stored without being sensed. An overlay (not shown) may also be provided over the tablet to aid in content navigation. For example, the overlay may include a channel accessing area and subject classes for web content. The accessed content may include any suitable information, such as a cable, satellite, or network channel, a web page, graphical and/or text data files, etc. The accessed content is then displayed on the television 510.

The physical objects or disks 502 in this implementation, or the other implementations described above, may be sold by content providers wishing to promote particular programs or web sites. For example, the disks may be sent along with a customer's TV Guide, a promotional flyer, or made available at a supermarket or sent through the mail. Customers may then use the disk within their detection system (*e.g.*, 103 of FIG. 1 or 103' of FIG. 5) to access the particular program or web site.

The disks may be used to display content on the user's computer or television, store content on the user's computer system, or to setup a recording session of the promoted particular program. Other disks may be used to filter certain data content subject matter, (*e.g.*, a particular disk may correspond to cartoons only), to control access for children or to setup subject preferences for others. Other disks may indicate a maximum viewing time for web surfing or television watching. When a timing disk is placed within the detection system, content viewing time is limited to the defined maximum time of the disk. In other embodiments, specific disks may each correspond to a particular web browsing function, such as scrolling or selecting a link.

Regardless of interactive system's configuration, it may employ one or more

memories or memory modules configured to store data, program instructions for the accessing remote data content and/or detection and data analysis mechanisms described herein. The program instructions may control the operation of an operating system and/or one or more applications, for example. The memory or memories may also be configured to store positional data, identity data, accessed data content, etc.

Because such information and program instructions may be employed to implement the systems/methods described herein, the present invention relates to machine readable media that include program instructions, state information, etc. for performing various operations described herein. Examples of machine-readable media include, but are not limited to, magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD-ROM disks; magneto-optical media such as floptical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory devices (ROM) and random access memory (RAM). The invention may also be embodied in a carrier wave travelling over an appropriate medium such as airwaves, optical lines, electric lines, etc. Examples of program instructions include both machine code, such as produced by a compiler, and files containing higher level code that may be executed by the computer using an interpreter.

Although the foregoing invention has been described in some detail for purposes of clarity of understanding, it will be apparent that certain changes and modifications may be practiced within the scope of the appended claims. Therefore, the described embodiments should be taken as illustrative and not restrictive, and the invention should not be limited to the details given herein but should be defined by the following claims and their full scope of equivalents. For example, communication over a wide area network (*e.g.*, Internet) may be initiated based on any combination of detected inputs from a plurality of objects (*e.g.*, position, identity, states of interactive devices, etc.). Additionally, the communication may be based on detected states of a plurality of objects over a period of time (*e.g.*, communication is based on a gesture movement). Additionally, communication may

simply be based on a current orientation of a single object or a current selectable state (*e.g.*, temperature, pressure, voltage, current, velocity, etc.) of a single object. By way of a final example, specific communication types (*e.g.*, game content downloading or posting, web page presentation, chat session initiation, initiating an email session, video and/or audio streaming, or video conferencing) may be initiated by any type of interaction with one or more objects.

Although the foregoing invention has been described in some detail for purposes of clarity of understanding, it will be apparent that certain changes and modifications may be practiced within the scope of the appended claims. Accordingly, the present embodiments are to be considered as illustrative and not restrictive, and the invention is not to be limited to the details given herein, but may be modified within the scope and equivalents of the appended claims.

CLAIMS

What is claimed is:

1. An interactive system associated with a first computer for communicating with a second computer over a data network, the interactive system comprising:

a detection system having a plurality of physical objects and a sensor, wherein the physical objects have a plurality of states that are each detectable by the sensor; and

a computer readable medium having programming instructions for communicating with the detection system and the second computer, wherein communicating with the second computer is based on a combination of two or more states of the physical objects detected.

2. An interactive system as recited in claim 1, wherein the combination of two or more states are selected from a group consisting of one or more positions of one or more of the physical objects, an identity of one or more physical objects, and a current setting of a plurality of user selectable states, other than a position state, for one or more physical objects.

3. An interactive system as recited in claim 2, wherein the one or more positions of the one or more physical objects are relative to each other.

4. An interactive system as recited in claim 2, wherein the one or more positions of the one or more physical objects are relative to the sensor.

5. An interactive system as recited in claim 2, wherein the one or more positions each includes an x, y, and z position of the one or more physical objects.

6. An interactive system as recited in claim 1, wherein the detection system is implemented with an electromagnetic detection technology, each physical

object having a resonator circuit that is activated by an excitation signal and the sensor being configured to detect a resonating signal from the resonator circuit.

7. An interactive system as recited in claim 6, wherein each resonator circuit of each physical object has a unique resonating frequency.

8. An interactive system as recited in claim 6, wherein at least two of the each resonator circuit of each physical object has a same resonating frequency but the each resonator circuit being placed at a different position relative to its physical object.

9. An interactive system as recited in claim 1, wherein communicating with the second computer is selected from a group consisting of a hypertext transfer, a file transfer, and an email transfer.

10. An interactive system as recited in claim 1, wherein communicating with the second computer is performed via a wide area network.

11. An interactive system associated with a first computer for communicating with a second computer over a wide area network, the interactive system comprising:

a detection system having a physical object and a sensor, wherein the physical object has a plurality of states that are each detectable by the sensor and that are states other than position states of the physical object relative to the sensor; and

a computer readable medium having programming instructions for communicating with the detection system via the first computer and for communicating with the second computer via a wide area network, wherein communicating with the second computer network is based on a current state of the physical object.

12. An interactive system as recited in claim 11, wherein communicating with the second computer is further based on detected states of the physical object over time.

13. An interactive system as recited in claim 11, wherein the detection of the current state of the physical object is based on a current position of the physical object that is detected by the sensor.

14. An interactive system as recited in claim 11, wherein the physical object includes a rotatable knob and the states of the physical object are a plurality of rotational positions.

15. An interactive system as recited in claim 11, wherein the physical object includes a movable lever and the states of the physical object are a plurality of lever positions.

16. An interactive system as recited in claim 11, wherein the physical object includes a sensor and the states of the physical object are a plurality of sensor states.

17. An interactive system as recited in claim 16, wherein the sensor is a temperature sensor and the sensor states are temperatures.

18. An interactive system as recited in claim 16, wherein the sensor is a voltage sensor and the sensor states are voltage values.

19. An interactive system as recited in claim 16, wherein the sensor is a current sensor and the sensor states are current values.

20. An interactive system as recited in claim 16, wherein the sensor is a pressure sensor and the sensor states are pressure values.

21. An interactive system as recited in claim 16, wherein the sensor is a velocity sensor and the sensor states are velocity values.

22. An interactive system as recited in claim 11, wherein the computer readable medium is selected from a group consisting of one or more floppy disks, one or more optical media, one or more magneto-optical media, a carrier wave, and a configured hardware device.

23. An interactive system as recited in claim 11, wherein communicating with the second computer includes tasks selected from a group consisting of downloading data to the first computer, posting data to the second computer, and setting up a communication session between the first computer and the second computer.

24. An interactive system as recited in claim 11, wherein the detection system is implemented with an electromagnetic detection technology, the physical object having a resonator circuit that is activated by an excitation signal and the sensor being configured to detect a resonating signal from the resonator circuit.

25. An interactive system as recited in claim 11, wherein communicating with the second computer is selected from a group consisting of a hypertext transfer, a file transfer, and an email transfer.

26. An interactive system as recited in claim 11, wherein the wide area network is the Internet.

27. An interactive system associated with a first computer for communicating with a second computer over a wide area network, the interactive system comprising:

a detection system having a physical object and a sensor, wherein the physical object has a plurality of orientation positions that are each detectable by the sensor; and

a computer readable medium having programming instructions for communicating with the detection system via the first computer and for communicating with the second computer via a wide area network, wherein communicating with the second computer is based on a current orientation of the physical object.

28. An interactive system as recited in claim 27, wherein the orientation positions includes a plurality of rotational positions

29. An interactive system as recited in claim 27, wherein the orientation positions includes a plurality of pitch positions.

30. An interactive system as recited in claim 27, wherein the orientation positions includes a plurality of yaw positions.

31. An interactive system as recited in claim 27, wherein the detection system is implemented with an electromagnetic detection technology, the physical object having a resonator circuit that is activated by an excitation signal and the sensor being configured to detect a resonating signal from the resonator circuit.

32. An interactive system as recited in claim 27, wherein communicating with the second computer is selected from a group consisting of a hypertext transfer, a file transfer, and an email transfer.

33. An interactive system as recited in claim 27, wherein the wide area network is the Internet.

34. An interactive system associated with a first computer for communicating with a second computer over a data network, the interactive system comprising:

a detection system having a plurality of physical objects and a sensor, wherein the physical objects have a plurality of positions that are each detectable by the sensor; and

a computer readable medium having programming instructions for communicating with the detection system and the second computer, wherein communicating with the second computer is based on one or more positions of the physical objects, wherein the positions are detected by the sensor and are non-discrete.

35. An interactive system as recited in claim 34, wherein the positions of the physical objects are relative to the sensor.

36. An interactive system as recited in claim 35, wherein the positions includes an x, y, and z position of the physical objects.

37. An interactive system as recited in claim 34, wherein the detection system is implemented with an electromagnetic detection technology, each physical object having a resonator circuit that is activated by an excitation signal and the sensor being configured to detect a resonating signal from the resonator circuit.

38. An interactive system as recited in claim 37, wherein each resonator circuit of each physical object has a unique resonating frequency.

39. An interactive system as recited in claim 37, wherein at least two of the each resonator circuit of each physical object has a same resonating frequency but the each resonator circuit being placed at a different position relative to its physical object.

40. An interactive system as recited in claim 34, wherein communicating with the second computer is selected from a group consisting of a hypertext transfer, a file transfer, and an email transfer.

41. An interactive system as recited in claim 34, wherein communicating with the second computer is performed via a wide area network.

42. An interactive system associated with a first computer for communicating with a second computer over a data network, the interactive system comprising:

a detection system having a plurality of physical objects and a sensor, wherein interaction data associated with the physical objects is detectable by the sensor; and

a computer readable medium having programming instructions for communicating with the detection system and the second computer, wherein communicating with the second computer is based on detected interaction data associated with one or more of the physical objects, wherein the communicating is

selected from a group consisting of downloading game content from the second computer to the first computer, posting game content from the first computer to the second computer, displaying a web page at the first computer, initiating a chat session between the first and second computers, sending or receiving an email message to or from the second computer, setting up a video conference, and streaming video or audio to the first computer from the second computer or to the second computer from the first computer.

43. An interactive system as recited in claim 42, wherein the computer code for communicating with the second computer is a framework software component and wherein the computer readable medium further comprises an application software component having computer code for executing an application related to the theme, the framework being a separate component from the application software.

44. An interactive system as recited in claim 43, wherein the framework is configured to make a remote content segment available to the application software for later use by the application software.

45. An interactive system as recited in claim 44, wherein the remote content segment is downloaded into a directory associated with the application software.

46. An interactive system as recited in claim 42, wherein the detection system is implemented with an electromagnetic detection technology, each physical object having a resonator circuit that is activated by an excitation signal and the sensor being configured to detect a resonating signal from the resonator circuit.

47. An interactive system as recited in claim 46, wherein each resonator circuit of each physical object has a unique resonating frequency.

48. An interactive system as recited in claim 46, wherein at least two of the each resonator circuit of each physical object has a same resonating frequency but the each resonator circuit being placed at a different position relative to its physical

object.

49. An interactive system as recited in claim 42, wherein communicating with the second computer is selected from a group consisting of a hypertext transfer, a file transfer, and an email transfer.

50. An interactive system as recited in claim 42, wherein the detection system is in the form of a tablet-like controller for a television system and further comprises a pen device for entering handwriting motions, the communicating with the second computer being further based on handwriting motions of the pen device.

51. An interactive system as recited in claim 50, the detection system further comprising an overlay that is placed over the sensor to facilitate navigation through data content on the second computer by moving the physical objects over particular portions of the overlay and sensor to thereby cause remote content to be accessed that is associated with particular overlay portions.

52. An interactive system as recited in claim 51, wherein particular portions of the overlay indicate particular categories of web content.

53. An interactive system as recited in claim 42, the computer readable medium further comprises computer code for displaying the downloaded game content on a display device.

54. An interactive system as recited in claim 42, wherein the communicating with the second computer is performed via a computer network.

55. An interactive system as recited in claim 42, wherein the communicating with the second computer is performed via a cable television network or a satellite television network.

56. An interactive system as recited in claim 42, the computer readable medium further comprising computer code for filtering a first remote content segment from the second computer from being presented to the first computer based on the interaction data.

57. A computer implemented method associated with a first computer for communicating with a second computer over a data network, the method comprising:

in a detection system having a plurality of physical objects and a sensor, wherein the physical objects have a plurality of positions, detecting with the sensor at least one of the positions of at least one of the physical objects; and

communicating with the second computer based on one or more positions of the physical objects, wherein the positions are detected by the sensor and are non-discrete.

58. A computer implemented method associated with a first computer for communicating with a second computer over a data network, the method comprising:

in a detection system having a plurality of physical objects and a sensor, detecting with the sensor interaction data associated with the physical objects; and

communicating with the detection system and the second computer, wherein communicating with the second computer is based on detected interaction data associated with one or more of the physical objects, wherein the communicating is selected from a group consisting of downloading game content from the second computer to the first computer, posting game content from the first computer to the second computer, displaying a web page at the first computer, initiating a chat session between the first and second computers, sending or receiving an email message to or from the second computer, setting up a video conference, and streaming video or audio to the first computer from the second computer or to the second computer from the first computer.

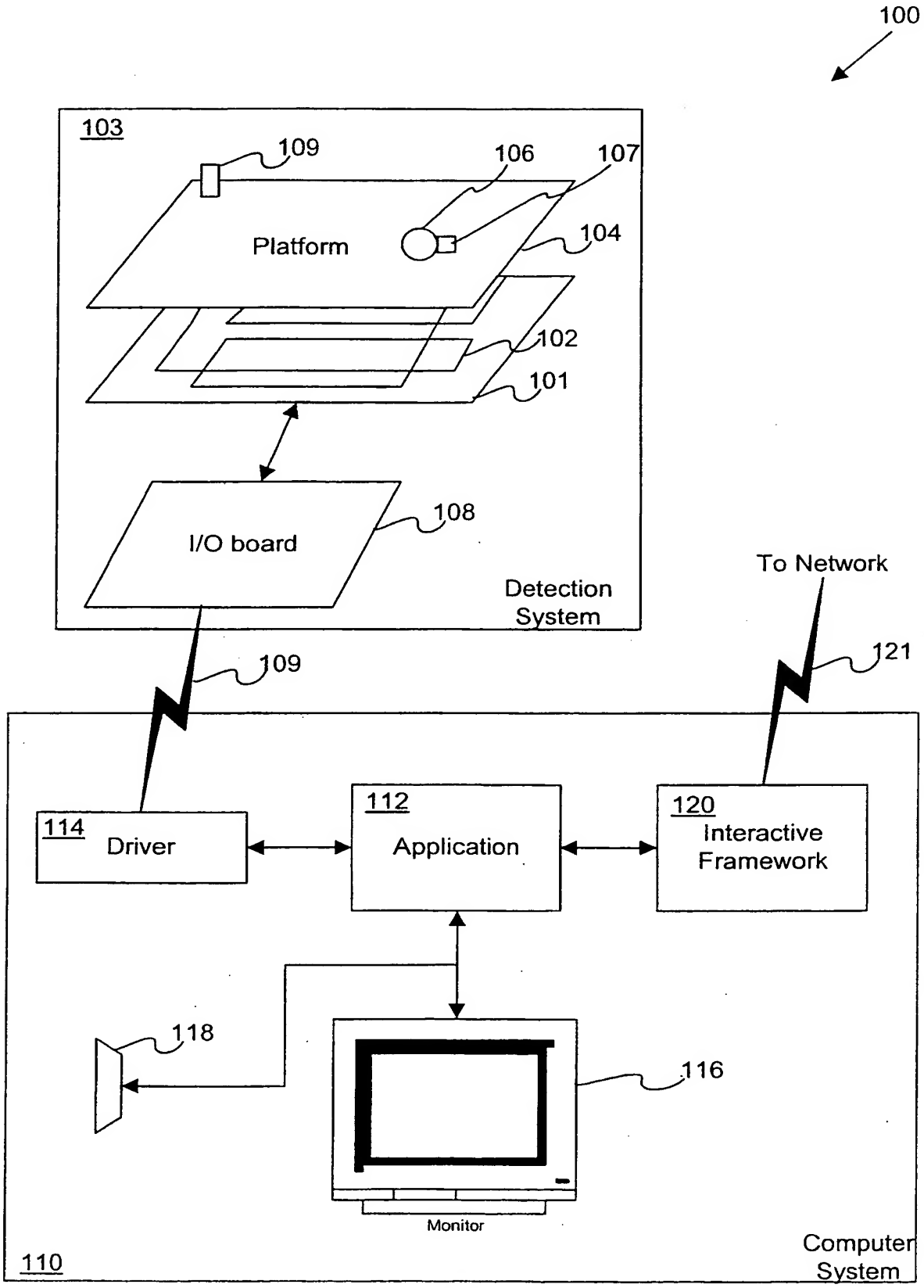


Figure 1

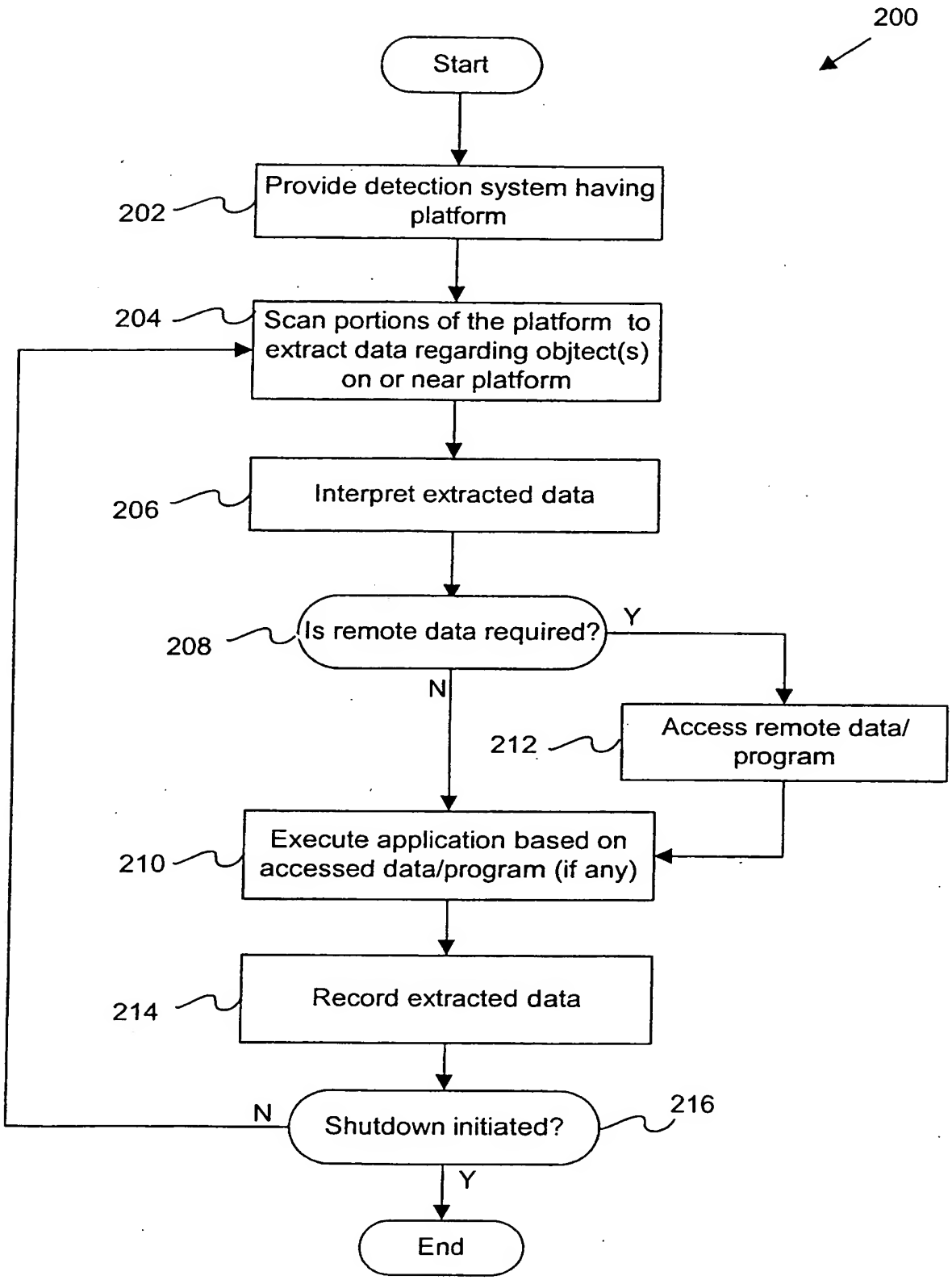


Figure 2

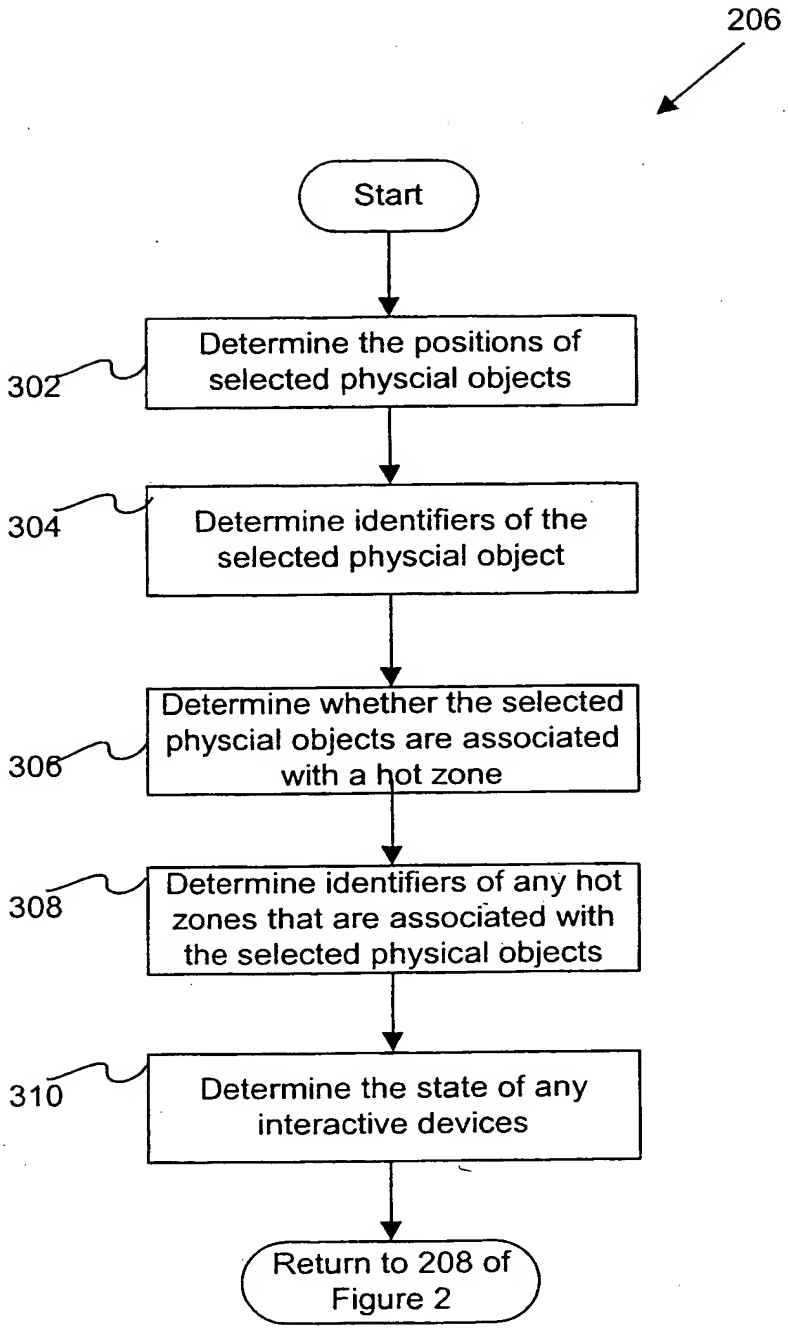


Figure 3

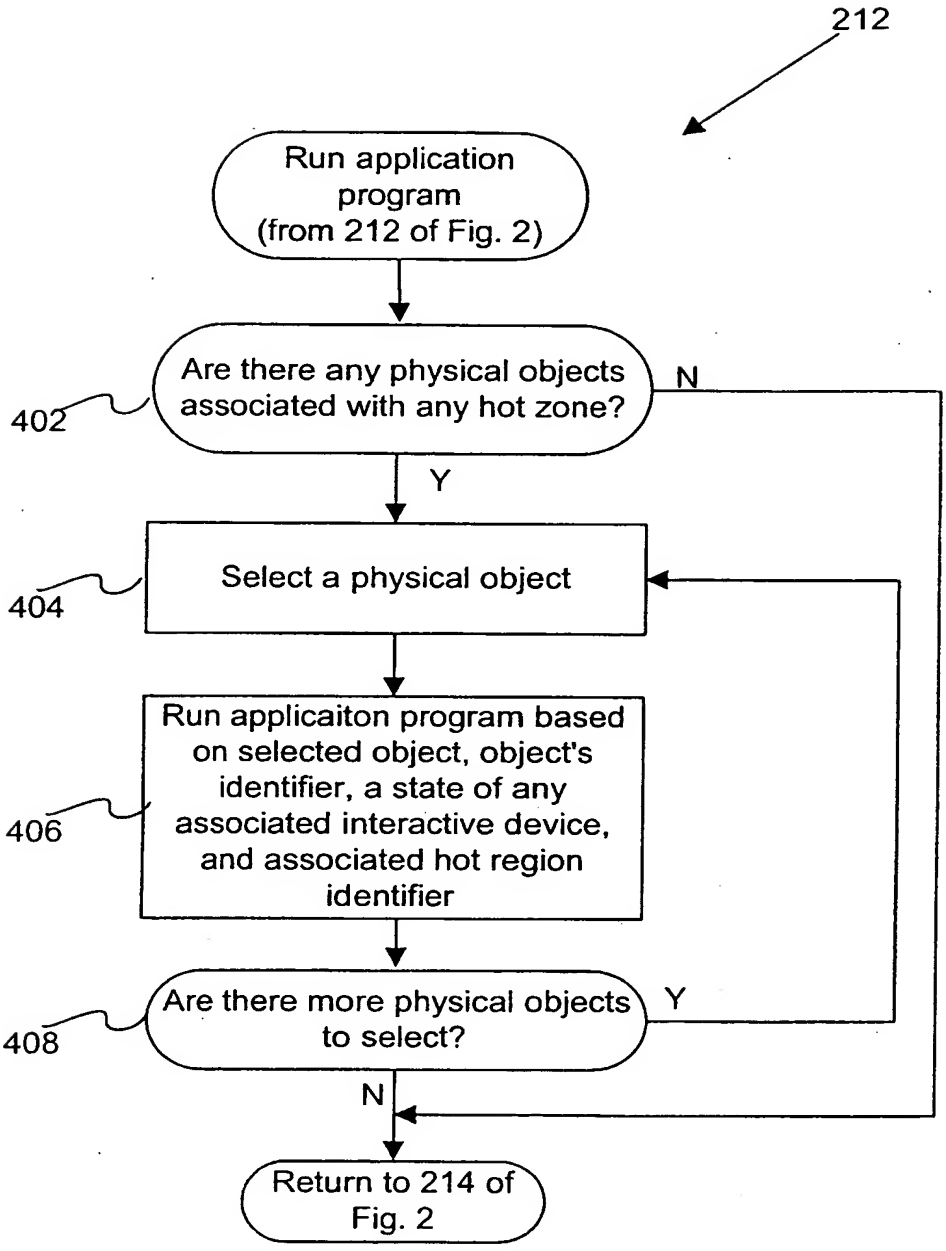

212
Run application program (from 212 of Fig. 2)
Are there any physical objects associated with any hot zone?
402
N
Y
Select a physical object
404
Run applicaiton program based on selected object, object's identifier, a state of any associated interactive device, and associated hot region identifier
406
Are there more physical objects to select?
408
Y
N
Return to 214 of Fig. 2

Figure 4

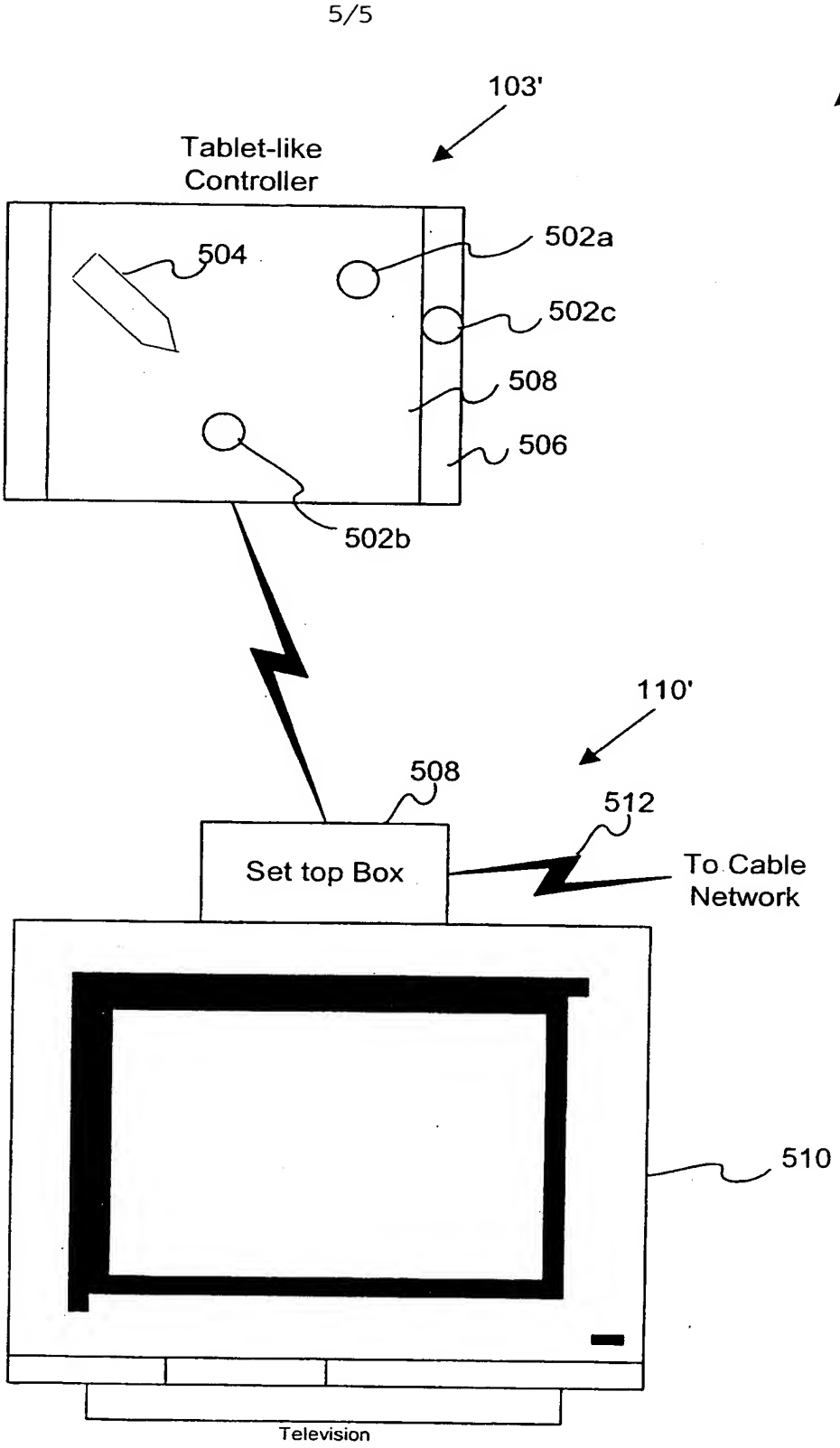


Figure 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 00/00662

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 3/03, G06F 17/30 // G06F 161:00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5013047 A (G.SCHWAB), 7 May 1991 (07.05.91), column 2, line 41 - column 3, line 37; column 4, line 63 - column 5, line 7; column 10, line 25 - line 48, figures 11-12, claims 1,10,15, abstract, column 11, line 66 - column 12, line 9	1-13,15-16, 22-27,31-49, 53-58
Y	abstract	50-52
	--	
Y	EP 0718750 A1 (NOKIA MOBILE PHONES LTD), 26 June 1996 (26.06.96), column 3, line 35 - column 4, line 24, figure 6, claim 1, abstract	50-52
	--	

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 February 2001	05. 04. 2001
Name and mailing address of the International Searching Authority European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel(+31-70)340-2040, Tx 31 651 epo nl, Fax(+31-70)340-3016	Authorized officer Pär Heimdal/LR Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 00/00662

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9706479 A2 (INTERVAL RESEARCH CORPORATION), 20 February 1997 (20.02.97), page 3, line 5 - page 5, line 8, figures 2,12, claims 1-2, abstract	1-13,15-16, 22-27,31-49, 53-58
A	US 5188368 A (P.RYAN), 23 February 1993 (23.02.93), abstract	1-58
A	EP 0701848 A2 (SEGA ENTERPRISES, LTD), 20 March 1996 (20.03.96), abstract	1-58

INTERNATIONAL SEARCH REPORT

Information on patent family members

05/02/01

International application No.
PCT/DK 00/00662

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5013047 A	07/05/91	AT 56291 T	15/09/90
		DE 3608148 A	24/09/87
		DE 3764803 D	00/00/00
		DK 594987 A	12/11/87
		EP 0289519 A,B	09/11/88
		JP 63503205 T	24/11/88
		NO 874702 A	11/11/87
		WO 8705723 A	24/09/87
EP 0718750 A1	26/06/96	FI 103837 B	00/00/00
		FI 946030 A	23/06/96
		JP 8234911 A	13/09/96
		US 6002387 A	14/12/99
WO 9706479 A2	20/02/97	AU 6646096 A	05/03/97
		EP 0842490 A	20/05/98
		US 5953686 A	14/09/99
US 5188368 A	23/02/93	AU 6630190 A	31/05/91
		DE 68901599 D	00/00/00
		EP 0360624 A,B	28/03/90
		JP 4506920 T	03/12/92
		WO 9106352 A	16/05/91
EP 0701848 A2	20/03/96	AU 699137 B	26/11/98
		AU 3067295 A	04/04/96
		CN 1127148 A	24/07/96
		JP 8084854 A	02/04/96
		TR 960235 A	00/00/00
		US 5694045 A	02/12/97